

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No: 10/052,396

REMARKS

Introduction and Overview

The present application relates to catadioptric projection lenses, i.e., to lens systems wherein refracting and reflecting components, such as lenses and mirrors, are combined. *See, e.g.*, ¶ [05] of the Specification. Prior to this Amendment, claims 1-26 were all the claims previously pending in the application. By this Amendment, Applicant is amending claims 1, 20, 23 and 26, canceling claims 4 and 9, and adding new claims 27-32.

In the Office Action dated March 10, 2003, the Examiner has rejected claims 1-4, 6, 9, 12-16, 18, 22 and 26 under 35 U.S.C. §102(b) as being anticipated by Hashimoto et al (US 5,289,312). Claims 1, 12, 13, 15, 16 and 20 are rejected under 35 U.S.C. § 102(b) as being anticipated by Oomura (US 5,668,672). In addition, claims 1, 14, and 19 are rejected under 35 U.S.C. § 102(b) as being anticipated by Fürter (U.S. 5,742,436). Claims 24 and 25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hashimoto as applied to claim 1, and further in view of Omura (US 6,081,382). Finally, the Office Action includes objections to claims 20 and 23 due to informalities.

Applicant thanks the examiner for acknowledging the claim for priority under 35 U.S.C. § 119, and receipt of the certified copy of the priority document submitted May 13, 2002. Applicant further thanks the Examiner for considering the references cited with the Information Disclosure Statements submitted May 13, 2002 and July 1, 2002, as well as for indicating that the drawings filed on January 23, 2002 are acceptable as formal drawings. Finally, the Applicant thanks the Examiner for the indication of presently allowable subject matter.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No: 10/052,396

Response to Objections and Rejections

Claims 20 and 23 are amended herein in the manner proposed by the Examiner.

Accordingly, Applicant requests that the objections to those claims be withdrawn.

Applicant is also amending claim 1, *inter alia*, to incorporate the limitations of former dependent claim 4. According to amended claim 1, the claimed projection lens includes a mirror group that receives light directly from and returns light directly to a beam splitter, and that has a refractive power transforming a divergent beam incident on the mirror group into a convergent beam.

An example of such a projection lens arrangement is shown in and described with respect to Fig. 1 of the application. This specific embodiment of the invention includes a beam splitter 5 and a mirror group 7 having a concave mirror 8. The mirror group 7, which is exclusively provided by the concave mirror 8 in this embodiment, transforms the divergent incident beam into a convergent reflected beam. *See, e.g., ¶¶ [30] and [43]-[45] of the Specification.* As explained, e.g., in the Summary of the Invention, such an arrangement allows the beam splitter to be radiated with non-collimated light. This, in turn, renders possible a variety of further innovations and advantages, including: (a) performing chromatic correction with the beam splitter and/or mirror group, i.e., before the light enters the second lens part 9; (b) constructing the second lens part 9 with lenses of moderate diameter; (c) constructing the beam splitter with relatively small volume, thereby saving material; etc. *See, e.g., ¶¶ [15], [17], [21] and [24].*

The grounds of rejection assert that Hashimoto et al. discloses, in Figure 1, a “refractive power of the mirror group … such that a divergent beam incident on the mirror group is

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No: 10/052,396

transformed into a convergent beam." Applicant respectfully traverses this ground of rejection and requests reconsideration.

Hashimoto et al. discloses a catadioptric reduction projection optical system having a first lens unit G1, a semi-transparent mirror 2, a second lens unit G2, a concave reflecting mirror 4, and a third lens unit G3. *See, e.g., Abstract; col. 2, line 50, to col. 3, line 4; and col. 6, line 49, to col. 7, line 8.* However, as evident from Fig. 1, the beam returned from the reflecting mirror 4 and the second lens unit G2 to the transparent mirror 2 is collimated when it reaches the transparent mirror 2. In clear distinction to the present application, Hashimoto et al. in fact expressly and unequivocally teaches that the light returned to the transparent mirror should be collimated:

...if the light beam transmitted through the semi-transparent mirror 2 deviates even slightly from a parallel light beam, aberrations such as astigmatism, etc. will be created. So, when the requirement to aberrations is severe, the light beam transmitted through the semi-transparent mirror 2 is first made approximate to a parallel light beam to thereby make coma sufficiently small.

Col. 7, lines 9-15.

Closing Remarks

Independent claim 1 and all pending claims dependent thereon should be allowable at least for the reasons presented above. The Examiner has acknowledged additional, independent reasons for allowing dependent claims 5, 7, 8, 10, 11, 17, 21, and 23. Independent method claim 26 should be allowable at least for reasons analogous to those presented above for claim 1.

Finally, Applicant is adding new claims 27-32. Independent claim 27 incorporates features from former claims 1 and 17 and therefore has already been examined and found

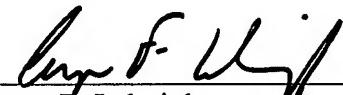
AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No: 10/052,396

allowable by the Examiner. Independent claim 30 incorporates features from former claims 1 and 21 and therefore, again, has been examined and deemed allowable.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

A Petition for a Two-Month Extension of Time as well as an Excess Claim Fee Payment Letter are enclosed. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



George F. Lehnigk
Registration No. 36,359

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373

23373

PATENT TRADEMARK OFFICE

Date: August 11, 2003